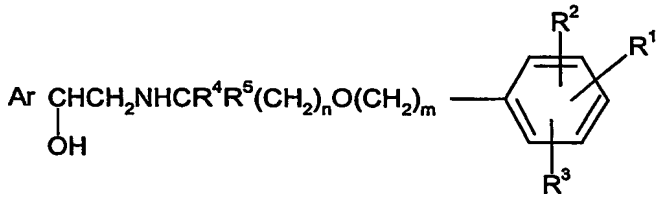
CLAIMS

1. A compound of formula (I)



(I)

or a salt, solvate, or physiologically functional derivative thereof, wherein:

n is an integer of from 2 to 8;
m is an integer of from 3 to 11, with the proviso that the sum of n + m is from 5 to 19;

R^1 is hydrogen or $-XSO_2NR^6R^7$;

wherein X is $-(CH_2)_p-$ or C_{2-6} alkenylene;

p is an integer from 0 to 6;

R^6 and R^7 are independently selected from hydrogen, C_{1-6}alkyl, C_{3-7}cycloalkyl, $CONR^8R^9$, phenyl and phenyl(C_{1-4}alkyl)-,

or R^6 and R^7, together with the nitrogen atom to which they are bonded, form a 5-, 6- or 7-membered nitrogen – containing ring;

and R^6 and R^7 are each independently optionally substituted by 1 or 2 groups independently selected from halo, C_{1-6}alkyl, C_{1-6}alkoxy, hydroxy-substituted C_{1-6}alkoxy, C_{1-6}haloalkyl, CO_2R^8, $SO_2R^8R^9$, $-CONR^8R^9$, $-NR^8C(O)R^9$ or a 5-, 6- or 7- membered heterocyclic ring;

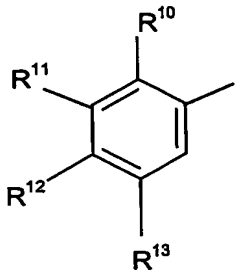
R^8 and R^9 are independently selected from hydrogen, C_{1-6}alkyl, C_{3-7}cycloalkyl, phenyl and phenyl(C_{1-6}alkyl)-;

R^2 and R^3 are independently selected from hydrogen, C_{1-6}alkyl, C_{1-6}alkoxy, halo, phenyl and C_{1-6}haloalkyl;

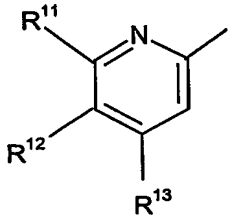
R^4 and R^5 are independently selected from hydrogen and C_{1-4} alkyl with the proviso that the total number of carbon atoms in R^4 and R^5 is not more than 4,

and

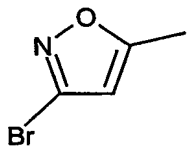
Ar is a group selected from



(a)

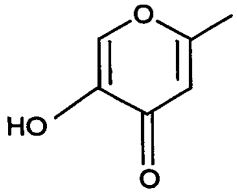


(b)



(c)

and



(d)

wherein R^{11} represents hydrogen, halogen, $-(CH_2)_qOR^{14}$, $-NR^{14}C(O)R^{15}$, $-NR^{14}SO_2R^{15}$, $-SO_2NR^{14}R^{15}$, $-NR^{14}R^{15}$, $-OC(O)R^{16}$ or $OC(O)NR^{14}R^{15}$,

and R^{10} represents hydrogen, halogen or C_{1-4} alkyl;

or R^{11} represents $-NHR^{17}$ and R^{10} and $-NHR^{17}$ together form a 5- or 6- membered heterocyclic ring;

R^{12} represents hydrogen, halogen, $-OR^{14}$ or $-NR^{14}R^{15}$; $-OC(O)R^{16}$ or $-OC(O)NR^{14}R^{15}$;

R^{13} represents hydrogen, halogen, haloC_{1-4} alkyl, $-OR^{14}$ or $-NR^{14}R^{15}$;

R^{14} and R^{15} each independently represents hydrogen or C_{1-4} alkyl, or in the groups $-NR^{14}R^{15}$, $-SO_2NR^{14}R^{15}$ and $-OC(O)NR^{14}R^{15}$, R^{14} and R^{15} independently represent hydrogen or C_{1-4} alkyl or together with the nitrogen atom to which they are attached form a 5-, 6- or 7- membered nitrogen-containing ring,

R^{16} represents an aryl (eg phenyl or naphthyl) group which may be unsubstituted or substituted by one or more substituents selected from halogen, C_{1-4} alkyl, hydroxy, C_{1-4} alkoxy or halo C_{1-4} alkyl; and

q is zero or an integer from 1 to 4;

provided that when R^1 is hydrogen
Ar is not a group (a) wherein;
R^{11} is $-(CH_2)_qOR^{14}$, q is zero or 1 and R^{12} is OR^{14},
or R^{11} is $-(CH_2)_qOR^{14}$, q is zero and R^{13} is OR^{14},
or R^{11} is $-NR^{14}SO_2R^{15}$ or $NR^{14}COR^{15}$ and R^{12} is OR^{14},
or R^{11} and R^{13} both represent halogen and R^{12} is $NR^{14}R^{15}$;
Ar is not a group (b) wherein R^{11} is $-(CH_2)_qOR^{14}$ and R^{12} is OR^{14};
Ar is not a group (c),
and when R^1 is $XSO_2NR^6R^7$, Ar is not a group (a) wherein
R^{11} is $(CH_2)_qOR^{14}$ or $NR^{14}COR^{15}$, and R^{12} is OR^{14}.

2. A compound of formula (I) according to claim 1 wherein, in the group Ar, R^{11} represents halogen, $-(CH_2)_qOR^{14}$, $-NR^{14}C(O)R^{15}$, $-NR^{14}SO_2R^{15}$, $-SO_2NR^{14}R^{15}$, $-NR^{14}R^{15}$, $-OC(O)R^{16}$ or $OC(O)NR^{14}R^{15}$,

and R^{10} represents hydrogen,

or R^{11} represents $-NHR^{17}$ and R^{10} and $-NHR^{17}$ together form a 5- or 6- membered heterocyclic ring;

and

R^{13} represents hydrogen, halogen, haloC_{1-4} alkyl, $-OR^{14}$, or $-NR^{14}R^{15}$;

and all other substituents are as definedin claim 1.

3. A compound of formula (I) according to claim 1 or claim 2 wherein the group R^1 is attached to the meta-position relative to the $-O-(CH_2)_m$ link.

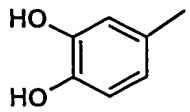
4. A compound of formula (I) according to any of claims 1 to 3 wherein R^1 represents $SO_2NR^6R^7$ wherein R^6 and R^7 are independently selected from hydrogen and C_{1-6}alkyl.

5. A compound of formula (I) according to any of claims 1 to 4 wherein R^4 and R^5 are independently selected from hydrogen and methyl.

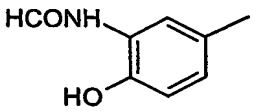
6. A compound of formula (I) according to any of claims 1 to 5 wherein R^2 and R^3 each represent hydrogen.

7. A compound of formula (I) according to any of claims 1 to 6 wherein n is 5 or 6 and m is 3 or 4 such that m + n is 8, 9 or 10.

8. A compound of formula (I) according to any of claims 1 to 7 wherein Ar represents a group selected from:



(i)



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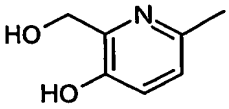

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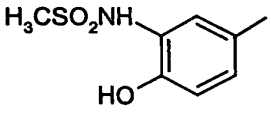

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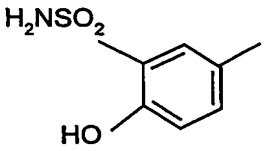
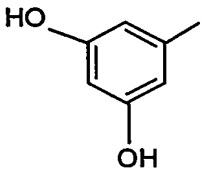


(v)

(vi)



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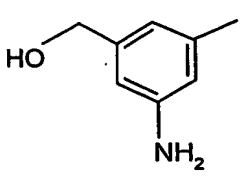
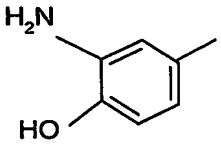


(viii)



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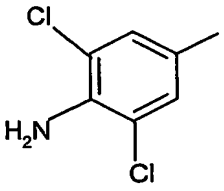
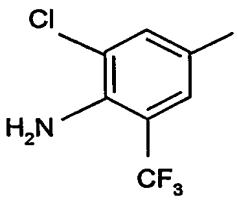


(x)



(xi)

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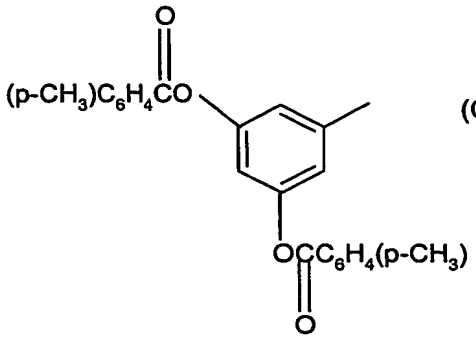
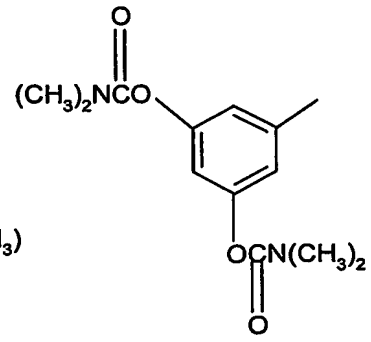
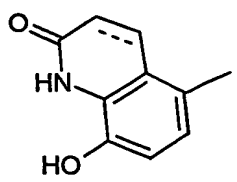


(xii)



(xiii)

(xiv)



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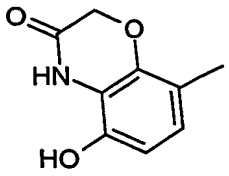
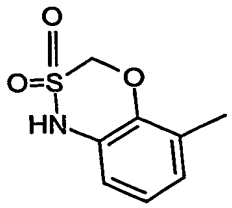
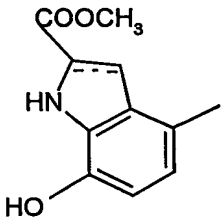


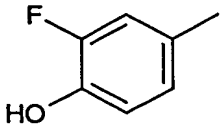
(xvi)



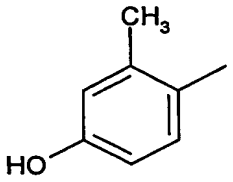
(xvii)



(xviii)



(xix)



(xx)

9. A compound of formula (I) according to any of claims 1 to 8 wherein R^1 is hydrogen and Ar is selected from a group of structure (ii), (v), (vi), (viii), (ix), (xi), (xii), (xiii), (xiv), (xv), (xvi), (xvii) and (xviii).

10. A compound of formula (I) according to any of claims 1 to 8 wherein R^1 is $XSO_2NR^6R^7$ and Ar is selected from a group of structure (iii), (iv), (xiv), (xv), (xvi) and (xix)

11. A compound of formula (I) selected from:
8-Hydroxy-5-((1*R*)-1-hydroxy-2-{[6-(4-phenylbutoxy)hexyl]amino}ethyl)quinolin-2(1*H*)-one;
3-{4-[(6-{[(2*R*)-2-Hydroxy-2-(8-hydroxy-2-oxo-1,2-dihydroquinolin-5-yl)ethyl]amino}hexyl)oxy]butyl}benzenesulfonamide;
5-Hydroxy-8-(1-hydroxy-2-{[6-(4-phenylbutoxy)hexyl]amino}ethyl)-2*H*-1,4-benzoxazin-3(4*H*)-one;
3-{4-[(6-{[2-hydroxy-2-(5-hydroxy-3-oxo-3,4-dihydro-2*H*-1,4-benzoxazin-8-yl)ethyl]amino}hexyl)oxy]butyl}benzenesulfonamide;

4-Hydroxy-7-((1*R*)-1-hydroxy-2-{[6-(4-phenylbutoxy)hexyl]amino}ethyl)-1,3-benzothiazol-2(3*H*)-one;
4-Hydroxy-7-(1-hydroxy-2-{[6-(4-phenylbutoxy)hexyl]amino}ethyl)-1,3-benzothiazol-2(3*H*)-one;
3-{4-[(6-{[(2*R*)-2-(3-Fluoro-4-hydroxyphenyl)-2-hydroxyethyl]amino}hexyl)oxy]butyl}benzenesulfonamide;
3-(4-{[6-({2-Hydroxy-2-[5-hydroxy-6-(hydroxymethyl)pyridin-2-yl]ethyl}amino)hexyl]oxy}butyl)benzenesulfonamide;
3-[4-({6-[((2*R*)-2-Hydroxy-2-{4-hydroxy-3-[(methylsulfonyl)amino]phenyl}ethyl)amino]hexyl}oxy)butyl]benzenesulfonamide;
3-{3-[(7-{[(2*R*)-2-(3-Fluoro-4-hydroxyphenyl)-2-hydroxyethyl]amino}heptyl)oxy]propyl}benzenesulfonamide;
3-(3-{[7-({2-Hydroxy-2-[5-hydroxy-6-(hydroxymethyl)pyridin-2-yl]ethyl}amino)heptyl]oxy}propyl)benzenesulfonamide;
3-[3-({7-[((2*R*)-2-Hydroxy-2-{4-hydroxy-3-[(methylsulfonyl)amino]phenyl}ethyl)amino]heptyl}oxy)propyl]benzenesulfonamide;
3-{3-[(7-{[(2*R*)-2-Hydroxy-2-(8-hydroxy-2-oxo-1,2-dihydroquinolin-5-yl)ethyl]amino}heptyl)oxy]propyl}benzenesulfonamide;
3-(3-{[7-({(2*R*)-2-[3-(Formylamino)-4-hydroxyphenyl]-2-hydroxyethyl}amino)heptyl]oxy}propyl)benzenesulfonamide;

or a salt, solvate or physiologically functional derivative thereof.

12. A method for the prophylaxis or treatment of a clinical condition in a mammal, such as a human, for which a selective β_2-adrenoreceptor agonist is indicated, which comprises administration of a therapeutically effective amount of a compound of formula (I) according to any of claims 1 to 11, or a pharmaceutically acceptable salt, solvate, or physiologically functional derivative thereof.

13. A compound of formula (I), according to any of claims 1 to 11, or a pharmaceutically acceptable salt, solvate, or physiologically functional derivative thereof for use in medical therapy.

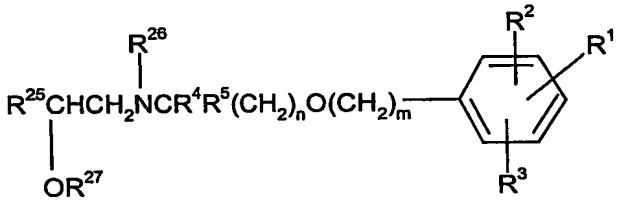
14. A pharmaceutical formulation comprising a compound of formula (I), according to any of claims 1 to 11, or a pharmaceutically acceptable salt, solvate, or physiologically

functional derivative thereof, and a pharmaceutically acceptable carrier or excipient, and optionally one or more other therapeutic ingredients.

15. The use of a compound of formula (I), according to any of claims 1 to 11, or a pharmaceutically acceptable salt, solvate, or physiologically functional derivative thereof in the manufacture of a medicament for the prophylaxis or treatment of a clinical condition for which a selective β_2-adrenoreceptor agonist is indicated.

16. A process for the preparation of a compound of formula (I), according to any of claims 1 to 11, or a salt, solvate, or physiologically functional derivative thereof, which comprises:

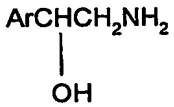
(a) deprotection of a protected intermediate of formula (II):



(II)

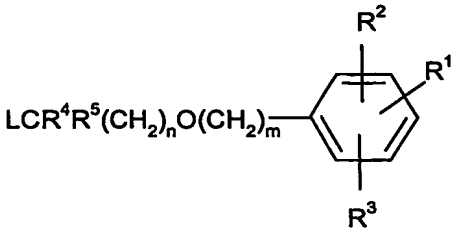
or a salt or solvate thereof, wherein R^1, R^2, R^3, R^4, R^5, m and n are as defined for the compounds of formula (I) R^{25} represents an optionally protected form of Ar, and R^{26} and R^{27} each independently represent either hydrogen or a protecting group, provided that the compound of formula (II) contains at least on protecting group;

(b) reacting a compound of formula (XIII):



(XIII)

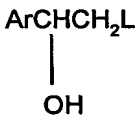
Wherein Ar is as defined above with a compound of formula (VI):



(VI)

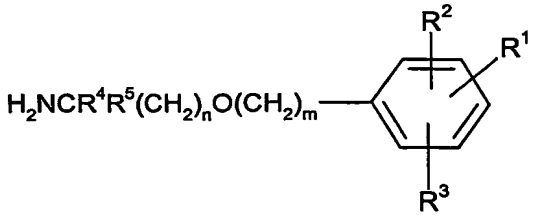
Wherein L is a leaving group such as halo (typically chloro, bromo or iodo) or a sulphonate (typically methanesulphonate) and R^1, R^2, R^3, R^4, R^5, n and m are as defined for compounds of formula (I).

(c) reacting a compound of formula (XV):



(XV)

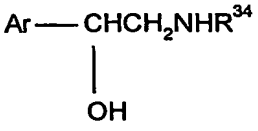
wherein L is a leaving group as hereinbefore defined, with an amine of formula (XVI):



(XVI)

wherein R^1, R^2, R^3, R^4, R^5, n and m are as defined for formula (I); and

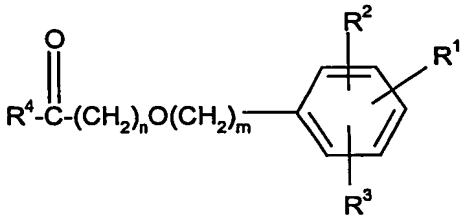
(d) (i) reacting a compound of formula (XIII):



(XIII)

Wherein Ar is as hereinbefore defined and R^{34} is a chiral auxiliary group,

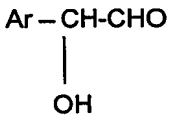
with a compound of formula (XVII):



(XVII)

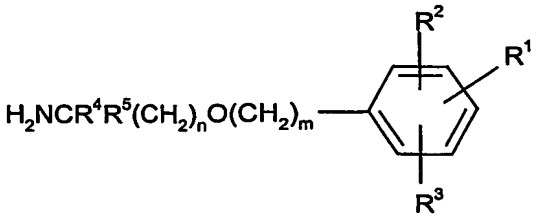
wherein R^1, R^2, R^3, R^4, n and m are as hereinbefore defined;
followed where necessary by removal of said chiral auxiliary group R^{34};

or (ii) reacting a compound of formula (XVIII):



(XVIII)

wherein Ar is as hereinbefore defined; with an amine of formula (XVI):



(XVI)

as hereinbefore defined,

under conditions suitable to effect reductive amination,

followed by the following steps in any order:

(i) optional removal of any protecting groups;

(ii) optional separation of an enantiomer from a mixture of enantiomers;

(iii) optional conversion of the product to a corresponding salt, solvate,

(iv) optional conversion of a group R^1, R^2 and/or R^3 to another group R^1, R^2 and/or R^3,

or physiologically functional derivative thereof.